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Trajectories of charged particles in Kähler magnetic fields

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Abstract

H-planar flows on Kähler manifolds are considered. All flowlines of such flows are H-planar curves (the complex analogues of geodesies). We investigate equations which the Hamiltonian of an H-planar flow has to obey. We also propose a method of finding a general solution of these equations. With the help of proposed approach, trajectories of charged particles in magnetic fields of special form on Kähler manifolds of constant holomorphic sectional curvature are studied. Using the fact that Kähler manifolds of constant holomorphic sectional curvature admit an H-projective mapping on a flat Kähler manifold, the equations of particle motion are reduced to one ordinary differential equation of the second order.